

# **“Distributed Resources” Is This Really A Country- Western Song Theme?**

Advanced Turbine Systems  
Annual Program Review Meeting  
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Alexandria, VA

**DR – It Is Not a Song  
about a guy (or gal), a  
pickup truck, a beer and  
some lost love, but It Is  
a Sad Song!**

**CELERITY**  
E N E R G Y  
*creating powerful solutions together*

**Dave Hoffman**  
President & CEO

# What Makes It a Sad Song?

- There is 100 GWs of existing underutilized DR assets in the US and a total of 300 GWs globally
- There are hundreds of “interconnect” standards and implementation policies in the US
- Utilities see DR as a threat or their culture resists solutions that are not centralized
- State regulators are creating barriers to implementation “in the cause of protecting the customer”
- Technology providers lobby for their solution to the detriment of others when there is room for all

# How Does the Song End?

- The Electric Energy Infrastructure in the US and Internationally will be a mix of large centralized supply and delivery resources plus distributed systems that provide solutions to end-users as well as support for the larger network!

# Number of Domestic Gen-Sets

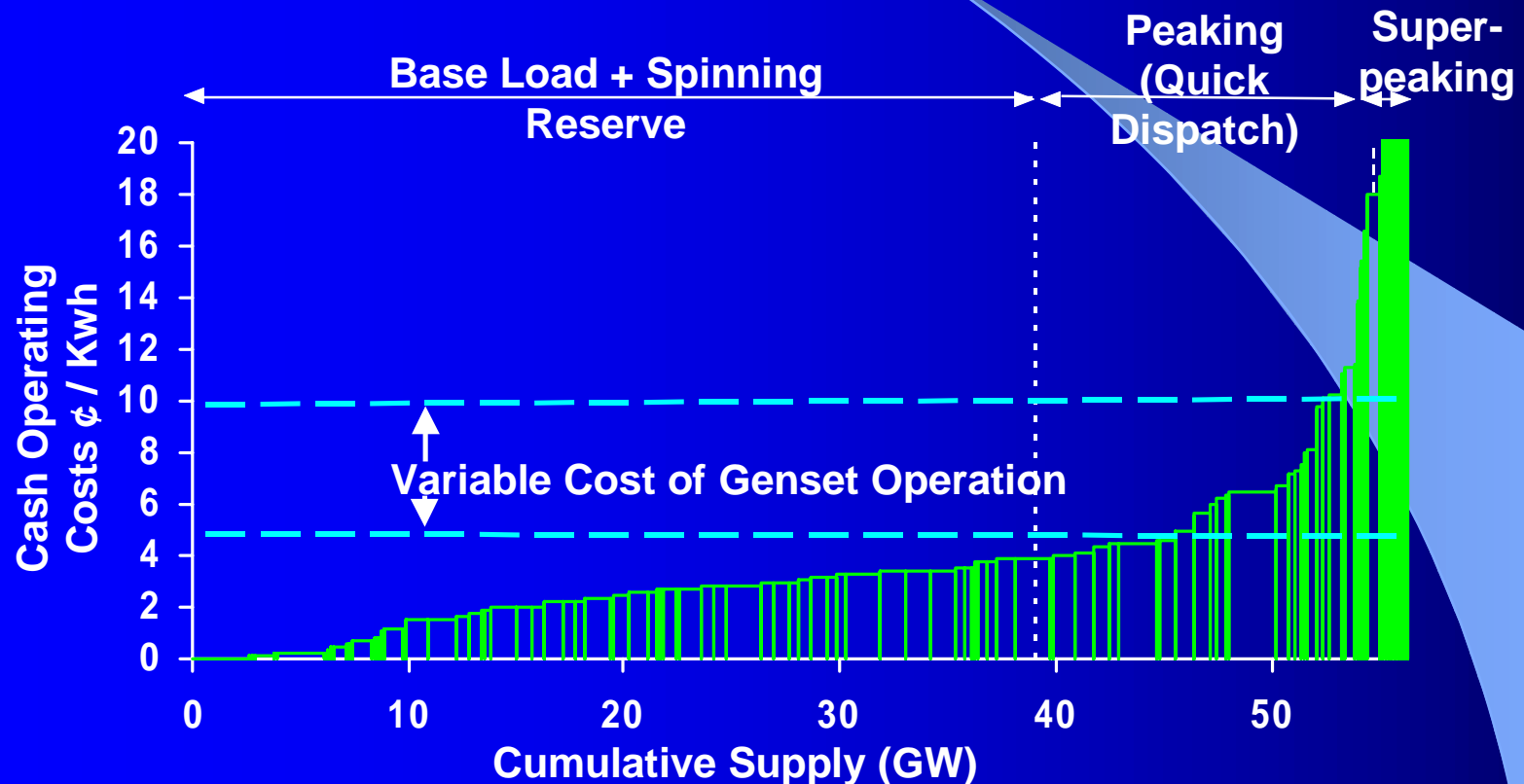
## Distributions by State

<u>STATE / kW Range</u>	<u>71-150</u>	<u>151-300</u>	<u>301-700</u>	<u>701-1200</u>	<u>1201-2000</u>	<u>2001+</u>	<u>Total</u>
California	23,558	14,373	7,062	5,259	5,257	1,968	79,882
Texas	14,739	18,717	5,807	4,127	3,772	1,280	63,791
Pennsylvania	10,839	7,373	3,049	2,395	2,300	662	34,680
New Jersey	4,880	4,885	2,021	1,544	1,800	425	20,896
Maryland	3,583	1,551	1,283	672	744	261	11,486
Washington	3,553	4,060	1,400	916	812	304	14,744
Arizona	1,421	2,708	1,120	220	650	230	9,310
Oregon	2,058	1,960	811	530	470	176	8,148

# Large Variation in Electricity Costs Today

*Wide Variation in Demand, Some Plants Used*

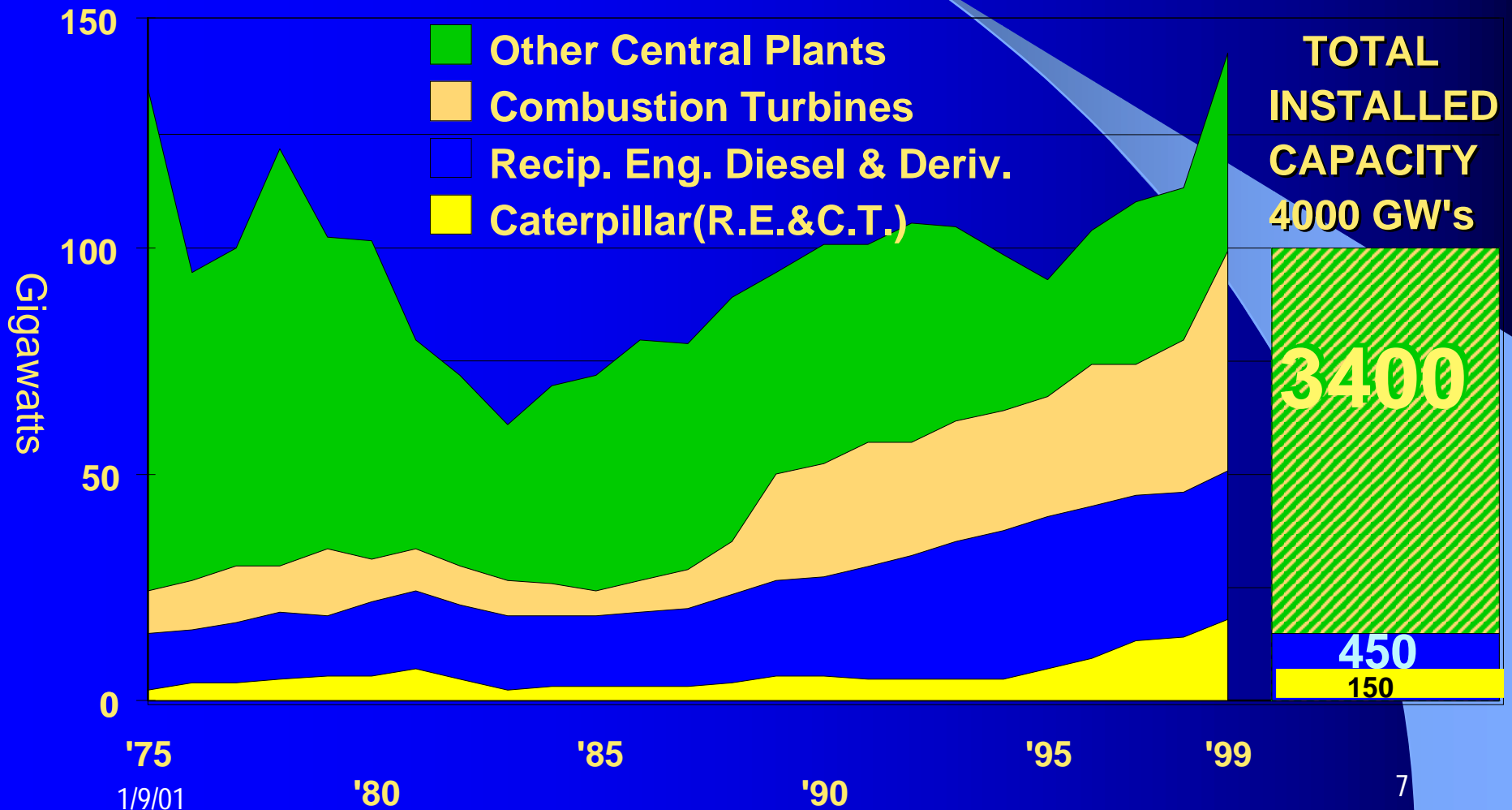
*<200 Hours/Year*



**De-averaged Pricing Will Encourage Customers to Find Other Ways to Meet Their Needs During Peak Periods**

# WORLD

## New Gen. Capacity Additions/year



1/9/01

Sources: ABB, GE, PSR, Parkinson, IEA, WEC, W-B, EBRD, Hagler-Bailly, PowerData Grp.

# California, Texas & Other States

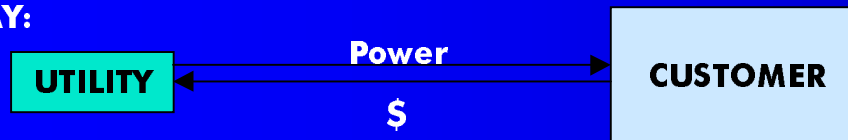
**It's The Uncertainty That Is the Barrier!**

- Uncertainty Regulatory Status – The Rules Keep Changing
- Interconnect Standards – The Utilities All Have different Standards & Policies (Today's Processor Based Technologies Can Provide a Better Solution)
- Rates or Pricing that Stimulates Users – State Regulators Continue to Create Artificial Barriers



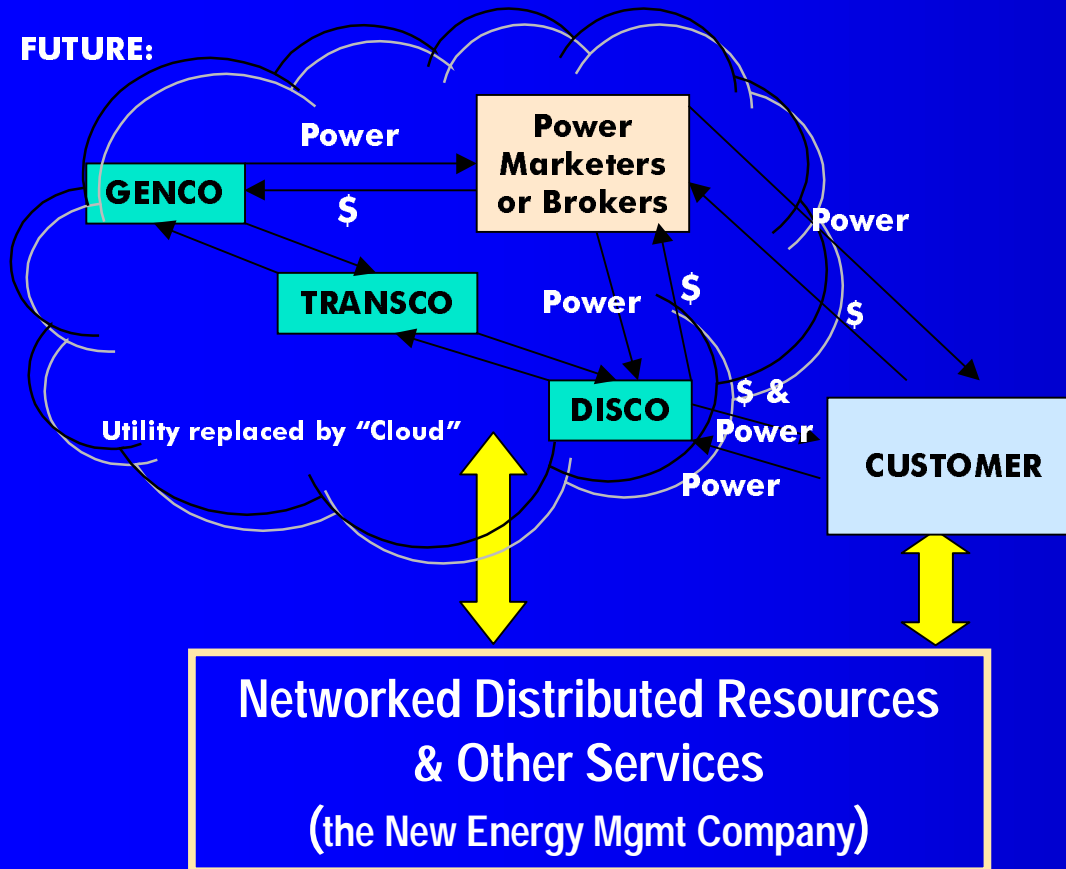
# How Will Deregulation Change The Power (Energy) Industry?

**TODAY:**



- Utility sells energy to **CUSTOMER**

**FUTURE:**



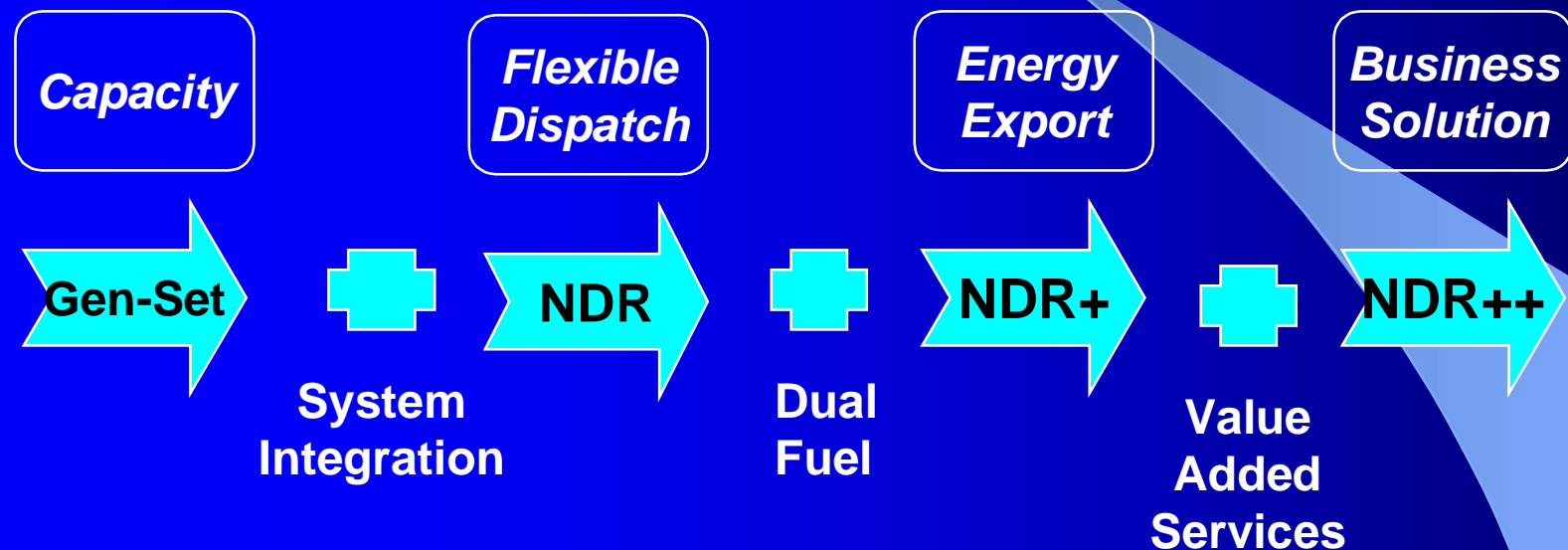
- **GENCO** sells bulk power to Power Marketer (or DISCO/CUSTOMER through other parties)
- **TRANSCO** transmits high voltage energy from GENCO to DISCO
- **DISCO** manages & maintains local distribution system to **END-USER** (or **CUSTOMER**)
- **NDRs** *emerge* serving supply side... expand toward customer side...
  - capacity - bulk market - ancillary service
  - quality - risk - efficiency/consumption
- **EMCO** - Energy Management Company - *emerge*
  - differentiates from Power Marketer/Broker
    - value added energy “SERVICES” from aggregated distributed resources
  - captures NDR's inward value to customer
    - Quality of Supply to customer's productivity and yield
    - Manage energy risk
    - energy commodity cost
  - manage customers interaction with **DISCO**
    - real vs. apparent power
    - harmonics
    - DSM
- **EMCO's** will manage energy sourcing and many energy capital equipment purchases at the “meter interface”
- Further into the future “Power” will mean all utility type resources (electricity, gas, water, process gases, etc.)

# Regulated or Market Pricing?

To achieve the maximum value from a distributed energy resource the marketplace must evolve to allow service providers the opportunity to create solutions for both the end-use customers and the electric grid.

Efforts to artificially set “market prices” through local or federal regulation will continue to inhibit the solutions that are available to “the grid” and to end-use customers.

# Networked Distributed Resources



*...this path continually grows with the addition of new Technologies  
and  
new Services for both the Utility and end customer*

# DG Applications & Locational Value

## APPLICATIONS

- Prime Power
- Small Power Plants (SPP)
- Standby/Emergency
- Load Management
- Individual & Fleet Rental/Leasing

## LOCATIONAL VALUE

- Networked Distributed Resource Facility (NDR)
- Combine Heat/ Power (CHP)
- Power Quality (PQ)
- Flexibility to match varying loads at different locations
- User Outsourcing
- Ancillary Services

# Future Energy Marketplace

## *On-Site, Tailored Utility Services*

### UTILITY ASSETS

### EMCO

- ✓ Acquire or Construct
- ✓ Own or Lease
- ✓ Operate & Maintain
- ✓ Partner
- ✓ Optimize Solutions

Electricity



Steam Heat



Refrigeration/Cold



Other Services

Customer

# Aggregating & Networking DR

The Process (the easy part)

- Select Target Market
- Identify Gen-sets (500kW to several MWs)
- Recruit-Aggregate 100MWs (~ 150 gen-sets)
- Test, complete engineering (if you can determine an interconnect standard), procure new controls, switch-gear and communications system
- Complete construction and startup testing

# Getting Value from the DR Network

- Negotiate a lease with gen-set owner (or buy)
- Develop a quality maintenance program
- Sell the output
  - capacity contracts
  - energy contracts
  - ancillary service contracts
- ✓ Manage the Risk (Liquidated damages/Non performance)
- ✓ Provide Services to the End-Use Customer

# Can We Put the Pieces Together?



- There Will Be Some Breaks
- Market Based Systems are Successful (e.g. UK)
- Regulatory Barriers Must be Minimized
- Value Must Come from Both Sides of the Meter!!!



# The Song Ends



With All Good  
C-W Songs,  
This One Has  
A Happier  
Ending –  
Distributed  
Resources  
Prosper !

*Don't you just love it*



1/9/01